

What is claimed:

1. A shoulder-belt-portion guiding assembly for more convenience and increased survival chance of a passenger of a transport system in an accident or during an in-flight turbulence,  
5 comprising a height-adjustable shoulder-belt-portion guiding deflector (**5, 5a, 5b, 5.10c**),  
which, serving as a member of a head rest (**3.6, 3.6a to 3.6c**) of a seat of the transport system, when adjusted to the body proportion of the passenger when using a seat belt,  
loosely guides a shoulder belt portion (**1.2**) of the seat belt, which downwardly extends over  
a shoulder and an upper body of the belted passenger; and  
10 prevents neck injury in the accident or during the in-flight turbulence.
2. The shoulder-belt-portion guiding assembly according to claim 1, wherein the head rest  
(**3.6a**) is height-adjustable and has the shoulder-belt-portion guiding deflector (**5a**) and at  
least two stiff head-rest tubes (**5.10**), moveable along members of a seat-backrest frame  
(**3.4**), guided thereby and locked therein, where the head rest (**3.6a**) is adjusted to a height of  
15 a head of the passenger and locked, thus resulting in an automatic adaptation of the shoulder-  
belt-portion guiding deflector with the shoulder belt portion (**1.2**) to the body proportion of  
the belted passenger.
3. The shoulder-belt-portion guiding assembly according to claim 1, wherein  
a main latch plate (**9**), moveable along the shoulder belt portion (**1.2**) or a lap belt portion  
20 (**1.3**) of the seat belt up to a main-latch-plate adaptor (**40**) fastened to the lap belt portion  
(**1.3**), is released from a main buckle assembly (**9.1**) when the seat belt is not being used  
and  
the seat belt is retracted by a belt retractor (**13, 13b**) until a spool (**13.1**) of which,  
containing an excess belt portion (**1.41**) of the seat belt, is full;  
25 where the passenger, wanting to use the seat belt, easily accesses the released main latch  
plate (**9**), loosely retained by the main-latch-plate adaptor (**40**) and located in a resting  
position (NU) between the shoulder-belt-portion guiding deflector (**5, 5a, 5b, 5.10c**) and  
a seat cushion (**3.1**).

4. The shoulder-belt-portion guiding assembly according to claim 3, wherein the resting position (NU) of the released main latch plate (9) is at a height of an elbow (50) of the passenger.

5. The shoulder-belt-portion guiding assembly according to claim 3, wherein the adaptor (40) consists of two pieces (40.1, 40.2), where a stud (40.11) of the first piece (40.1) is pressed through the lap belt portion (1.3), a belt webbing (1.31) of the lap belt portion (1.3) into a space, defined by the stud (40.11) with diameter ( $d_1$ ) and a hole (40.21) of the second piece (40.2) with diameter ( $d_2$ ) bigger than ( $d_1$ ), and into the hole (40.21) and jams therein.

6. The shoulder-belt-portion guiding assembly according to claim 1, wherein the shoulder-belt-portion guiding deflector (5, 5b), guided by a fixed member (3.9b, 3.20) of a seat-backrest frame (3.4), moveable therealong and nonrotating about a longitudinal centre axis ( $m_c$ ,  $V_c$ ) thereof, serves as a stiff head-rest tube (5, 5b) and has an upper portion, projecting through a top edge (3.22) of a seat backrest (3.2) and provided with an aperture (5.9), loosely guiding the shoulder belt portion (1.2); and  
15 a locking handle (5.2) of a locking device (80), having a latch (3.65) which, when unlocked, allows the movable, nonrotating, shoulder-belt-portion guiding deflector (5, 5b) with the shoulder belt portion (1.2) to be moved and adapted to the body proportion of the belted passenger.

7. The shoulder-belt-portion guiding assembly according to claim 6, wherein  
20 the fixed member (3.9b) of the seat-backrest frame (3.4) is a fixed guide tube (3.9b); the movable, nonrotating, shoulder-belt-portion guiding deflector (5b) has a pair of movable, semi-circular shaped portions (5.11b) in contact with a pair of fixed, semi-circular shaped edges (3.91b) of the fixed guide tube (3.9b); and where the pair of movable, semi-circle shaped portion (5.11b) slides along the pair of fixed,  
25 semi-circle shaped edges (3.91b), when the movable, nonrotating, shoulder-belt-portion guiding deflector (5b) is moved along the fixed guide tube (3.9b).

8. The shoulder-belt-portion guiding assembly according to claim 6, wherein the movable, nonrotating, shoulder-belt-portion guiding deflector (5) is a tube having a pair of movable, V-shaped contact-portions (5.60) each of which is defined by a pair of

movable, slanting members (5.81) and a movable, intermediate member interconnecting both movable, slanting members (5.81) and

the fixed member (3.20) of the seat-backrest frame (3.4) is a fixed, tube-shaped girder (3.20) having a pair of fixed, V-shaped contact portions (3.60) each of which is defined by a pair of fixed, slanting members (3.81) and a fixed, intermediate member interconnecting both fixed, slanting members (3.81);

where the movable, slanting members (5.81) in contact with the fixed, slanting members (3.81) slide therealong, when the movable, nonrotating, shoulder-belt-portion guiding deflector (5) is moved along the fixed, tube-shaped girder (3.20).

9. The shoulder-belt-portion guiding assembly according to claim 8, wherein the locking device (80) comprises

a shaft (3.64), projecting through the fixed, tube-shaped girder (3.20) and a pair of first ends of levers (3.66) secured thereto by a pair of pins (3.62);

the movable, nonrotating, shoulder-belt-portion guiding deflector (5), provided with a plurality of locking slots ( $L_1$ ) to ( $L_n$ ), where  $(i) = (1)$  to  $(n)$ ;

a pair of leaf springs (3.63), each of which having first and second eyes;

the latch (3.65), projecting through a pair of oblong holes (3.69) of the movable, nonrotating, shoulder-belt-portion guiding deflector (5), a pair of second ends of the levers (3.66) and both first eyes of the leaf springs (3.63) and secured by a pair of retaining rings (3.67);

a pair of rivets (3.68), each of which with a distance sleeve (3.71) protruding through the second eye of the leaf spring (3.63) and fastened to the movable, nonrotating, shoulder-belt-portion guiding deflector (5); and

the locking handle (5.2), fastened to one end of the shaft (3.64), where the locking handle (5.2), when rotated, moves the latch (3.65), being detached from the locking slot ( $L_2$ ), from a closed position (C) to an open position (O).

10. The shoulder-belt-portion guiding assembly according to claim 1, wherein the shoulder-belt-portion guiding deflector (5.10c), tube-shaped, guided by a fixed, tube-shaped girder (3.20c, 3.20d) of a seat-backrest frame (3.4), moveable therealong and nonrotating about a longitudinal centre axis ( $z_c$ ) thereof, serves as a single stiff head-rest tube (5.10c) and has an upper portion, projecting through a top edge (3.22) of a seat backrest (3.2);

a belt deflector (5c), loosely guiding the shoulder belt portion (1.2) and having a pair of transverse attachment holes (5.22), through which two bolts (5.26) are inserted and protruding portions of the bolts (5.26) are bolted to the upper portion; and  
a locking handle (5.2c) of a locking device (80c), having a latch (5.65), which, when  
5 unlocked, allows the movable, nonrotating, shoulder-belt-portion guiding deflector (5.10c) with the shoulder belt portion (1.2) to be moved and adapted to the body proportion of the belted passenger.

11. The shoulder-belt-portion guiding assembly according to claim 10, wherein the movable, nonrotating, shoulder-belt-portion guiding deflector (5.10c) has two pairs of  
10 movable, quarter-circle shaped tube-edges (5.45) in contact with two pairs of fixed, quarter-circle shaped girder-edges (3.45) of the fixed, tube-shaped girder (3.20c, 3.20d); where the movable, quarter-circle shaped tube-edges (5.45) slide along the fixed, quarter-circle shaped girder-edges (3.45), when the movable, nonrotating, shoulder-belt-portion guiding deflector (5.10c) is moved along the fixed, tube-shaped girder (3.20c, 3.20d).

12. The shoulder-belt-portion guiding assembly according to claim 10, wherein the locking device (80c) comprises

the movable, nonrotating, shoulder-belt-portion guiding deflector (5.10c), provided with a plurality of locking slots (L<sub>1</sub>) to (L<sub>n</sub>), where (i) = (1) to (n);

the latch (5.65), biased by a coil spring (5.63), sustained by a spring washer (5.66a) of a  
20 guiding sleeve (5.66) and a latching sleeve (5.61) secured thereto by a pin (5.62), and guided by the guiding sleeve (5.66) having a rectangular attachment base (5.66b), where the latch (5.65) is inserted through a girder-hole (3.70) of the fixed, tube-shaped girder (3.20c, 3.20d) and a tube-hole (5.70) of the movable, nonrotating, shoulder-belt-portion guiding deflector (5.10c) until the rectangular attachment base (5.66b) comes into  
25 contact with a side tube-wall (5.43) of the movable, nonrotating, shoulder-belt-portion guiding deflector (5.10c) and, finally, is fastened thereto by two bolts (5.67); and the locking handle (5.2c), fastened to one end portion of the latch (5.65) by a pin (5.68), where the locking handle (5.2c), when pulled, moves the latch (5.65) from the locking slot (L<sub>3</sub>), from a closed position (C) to an open position (O).

13. The shoulder-belt-portion guiding assembly according to claim 12, wherein the head rest (3.6c) is fastened to a free-end of the upper portion of the movable, nonrotating, shoulder-belt-portion guiding deflector (5.10c).

14. The shoulder-belt-portion guiding assembly according to claim 13, wherein

5 a main latch plate (9), moveable along the shoulder belt portion (1.2) or a lap belt portion (1.3) of the seat belt up to a main-latch-plate adaptor (40) fastened to the lap belt portion (1.3), is released from a main buckle assembly (9.1) when the seat belt is not being used and

10 the seat belt is retracted by a belt retractor (13, 13b) until a spool (13.1) of which, containing an excess belt portion (1.41) of the seat belt, is full;

where the passenger, wanting to use the seat belt, easily accesses the released main latch plate (9), loosely retained by the main-latch-plate adaptor (40) and located in a resting position (NU) between the shoulder-belt-portion guiding deflector (5.10c) and a seat cushion (3.1).

15 15. The shoulder-belt-portion guiding assembly according to claim 14, wherein the resting position (NU) of the released main latch plate (9) is at a height of an elbow (50) of the passenger.

16. The shoulder-belt-portion guiding assembly according to claim 10, wherein the fixed, tube-shaped girder (3.20d) has

20 a pair of top oblong holes (3.53), a pair of intermediate holes (3.52), a pair of bottom holes (3.51), to which a belt retractor (13b) and a pair of coupling fittings (1.2b) with vibration-dampening energy absorbers are bolted together with two big washers (13.8) by two bolts (13.9);

25 two pairs of sites of predetermined fracture (s), located between the respective holes proximate to each other; and

a centre oblong hole (3.25d), to receive an extending belt portion (1.4) of the seat belt and facilitate the pulling of the extending belt portion (1.4) and an upward movement of the belt retractor (13b) to the upper edges of the pair of top oblong holes (3.53) in the accident or during the in-flight turbulence.

17. The shoulder-belt-portion guiding assembly according to claim 1, wherein fixed, guide tubes (3.9b), fixed, tube-shaped girders (3.20, 3.20c, 3.20d) and the shoulder-belt-portion guiding deflectors (5, 5b, 5.10c) are extrusion components.

5 18. The shoulder-belt-portion guiding assembly according to claim 17, wherein the extrusion components are made from light metal.